



Helping Customers Lower TCO through Flowserve's Technology Advantage™ Web Portal

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VP IT Innovation



Empowering Business in Real Time
PI Infrastructure for the Enterprise

Agenda

- Background on Flowserve
- Challenges facing our customers
- Our offerings to help with these challenges
- Why we partnered with OSIsoft
- Our Technology Advantage™ Web Portal
- Questions

Background on Flowserve



Our Vision and Brand Promise

Vision

Distinguish Ourselves At Our Customers By
Delivering Integrated Flow Management Solutions
As A Global, Unified,
Customer-centric Business

Brand Promise

Flowserve is a ***Trusted Partner*** that uses its
collective experience and resources to help
customers exceed their business goals

A Leading Portfolio of Products, Solutions & Services

Core Industries

A Broad Set of Product Capabilities

Pumps - Valves - Seals



Power



Chemical



Oil / Gas



Water



General Industry



Aftermarket Support Services

Quick Response Centers (QRCs)



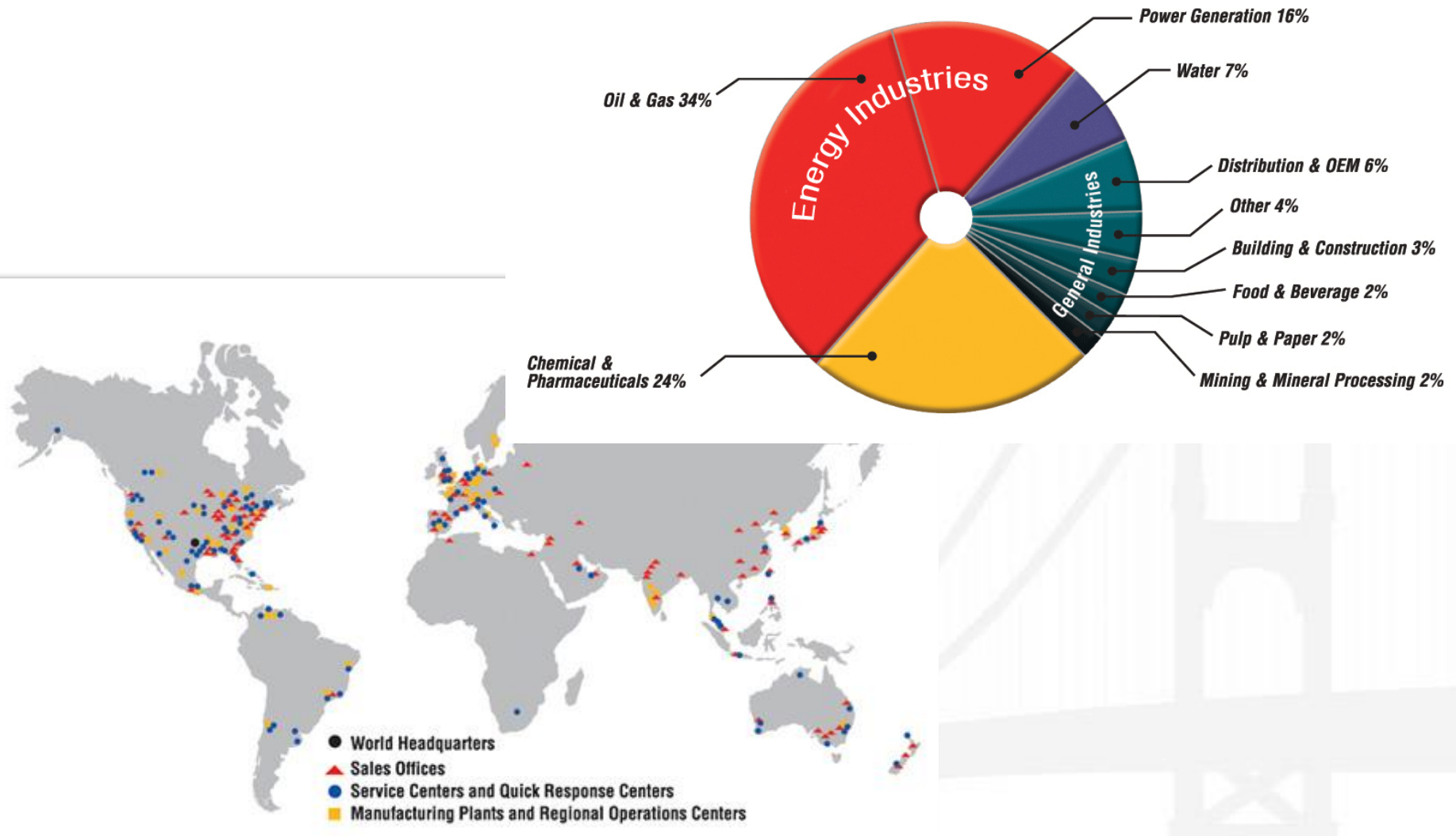
Localized
Support

Lower Total Cost
of Ownership

Company Overview

- More than 14,000 employees in 56 countries
- Customers in more than 70 countries
- World headquarters: Irving, Texas, USA
- Over 200 years of progress and innovation

Locations / Industries Supported



Challenges facing our customers



Challenges facing our customers



Operating
Budgets



Rising
Energy Costs



Rising
Operational
Costs

- Pressure to reduce or keep operating budgets flat
- Rising energy costs
- Spare part inventory
 - Availability
 - Carrying costs
- “Bad actor” systems
- Emergency breakdowns
 - Short cycled MTBR, MTBF, & MTBPM
- Lack of data / too much data
 - Expertise in what it all means
- Aging workforce
 - Rotating equipment expertise retiring



How our offerings help with
these challenges.....

Integrated Solutions Offerings.....

Technical Services

- Upgrades
- Life cycle cost transactional & performance contracts
- Engineering services

LifeCycle Advantage™

- Long term agreements
- Performance & availability contracts
- Primary & preferred source contracts

Educational Services

- Learning resource centers (Classroom & Labs)
- On Site standard & customized courses
- Remote hydraulic lab & training products

Consulting

- Technical assessments & audits
- Mentoring
- 3rd party benchmarking

Technology Advantage™

- Online assurance programs & enterprise data
- System optimization & equipment monitoring
- Edge intelligence & advanced diagnostics / prognostics

Our Advantage

Technology Advantage™ Information • Expertise • Performance



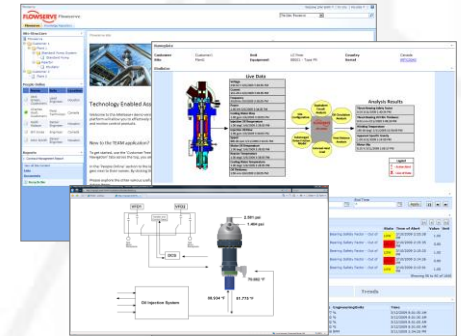
Global installed base,
product portfolio and
experience in fluid
motion and control



A global network of
service support,
technical resources
and Quick Response
Centers



Our commitment to
partner with our
customers to lower
their total Life Cycle
Cost



Continued technology
investments in intelligent
devices, advanced
communications & data
convergence

Creating the 'Service Model of the Future'

Why we partnered with OSIsoft?

Why we partnered with OsiSoft?



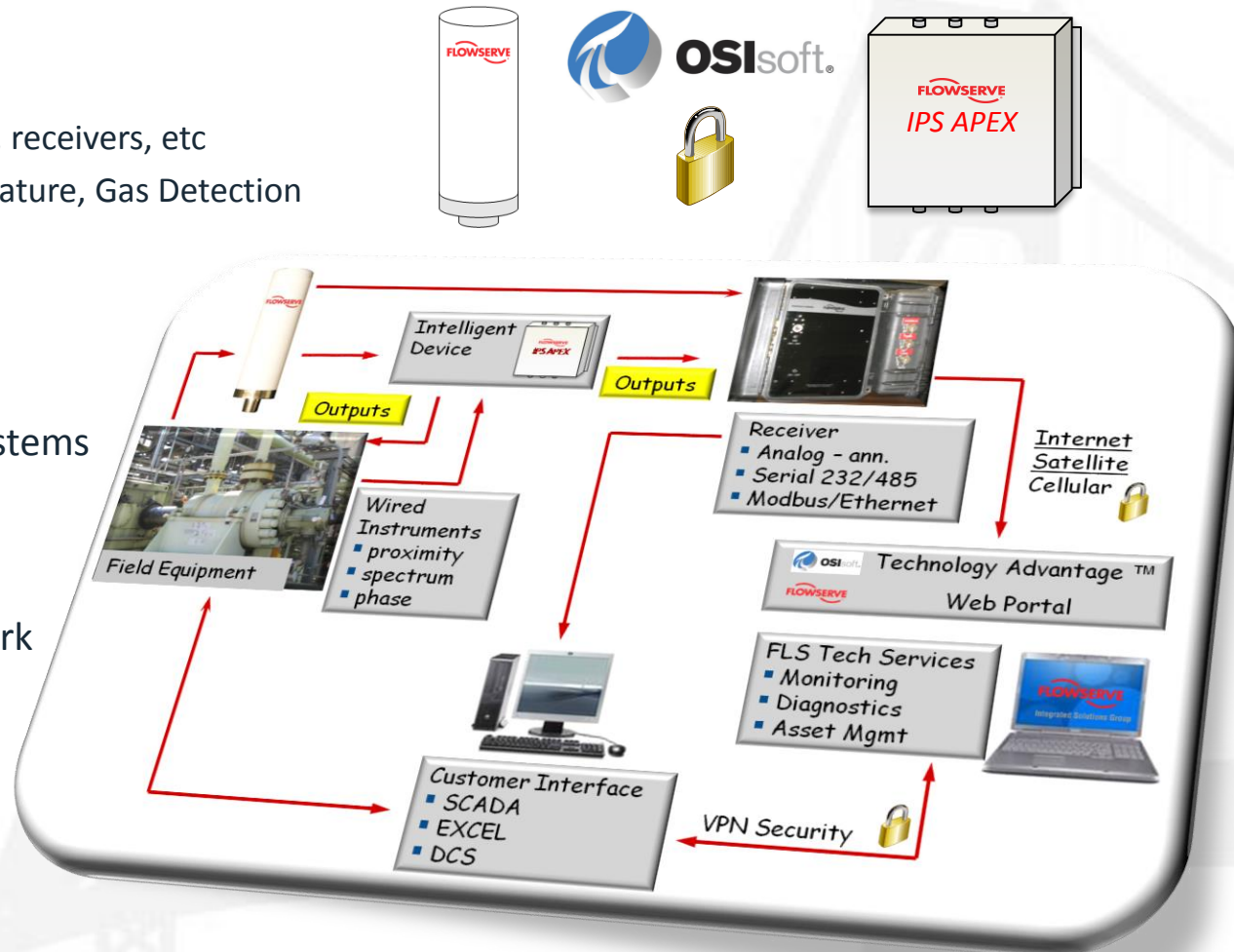
- A recognized leader in the industries we serve
- Global operation with over 600 employees worldwide
- 450+ Integration options
- EA was best option for us
 - Managed PI to ensure high availability
 - Covered our development, test & production needs
 - Dedicated enterprise project manager on our account

Our Technology Advantage™ Web Portal

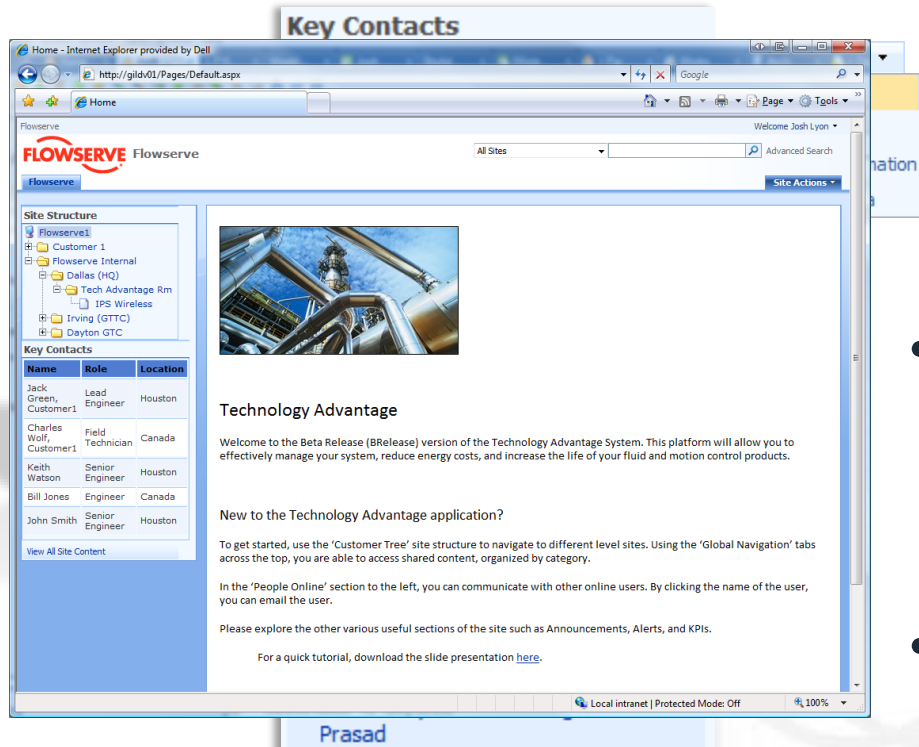


Getting information from the assets

- IPS Wireless
 - Wireless sensors, repeaters, receivers, etc
 - Pressure, Vibration, Temperature, Gas Detection
- IPS APEX
 - Edge device intelligence
- OSIsoft Platform
 - Connectivity to many systems
- Multiple Security Layers
- Communication Methods:
 - Satellite, Cellular, Network

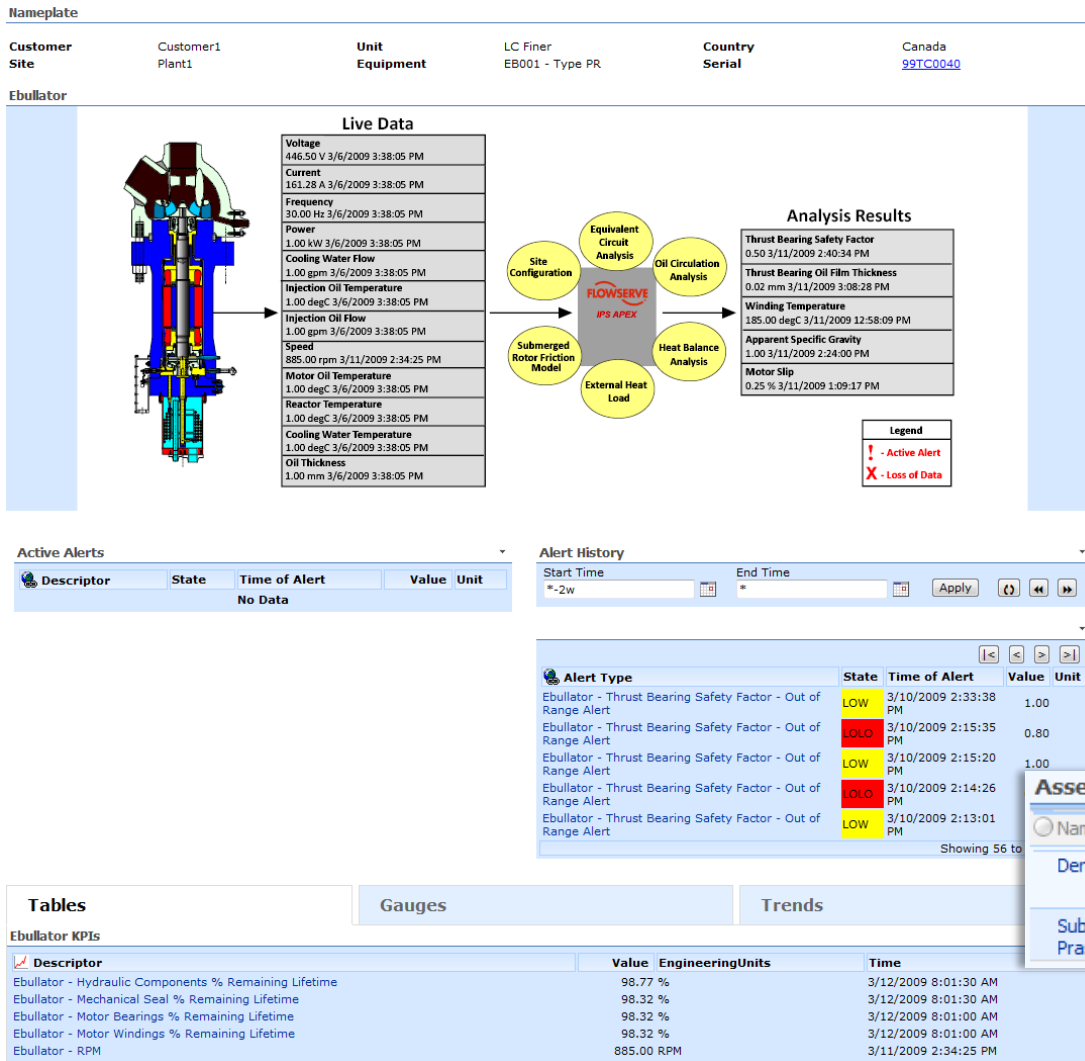


Site Entry



- Site Structure
 - Navigate the contracted customers
 - Follows: Customer > Site > Unit > Equipment
- Tabbed sections
 - Sections of a customer portal: reports, asset information, collaboration
- Key Contacts / Asset Experts
 - Access to asset-specific experts

Unit / Equipment Level



- Alarms / Notifications
- KPIs
- Schematics
- Data Views:
 - Tables
 - Gauges
 - Trends
- Contact: Asset Experts

Alarms / Notifications

Event/Alarm Summary

Descriptor	State	Time
AP001 - Axial Vibration - Trend Change Alarm	HIGH	10/17/2008 2:00:30 PM
AP001 - Flow - Instability Alarm		10/17/2008 7:59:04 AM
AP001 - Fluid Temperature - Out of Range Alarm		10/16/2008 7:18:51 AM
AP001 - Radial Vibration - Trend Change Alarm	HIGH	10/17/2008 1:57:30 PM
AP001 - Power - Change of Status Alarm		10/16/2008 7:18:51 AM
AP001 - Discharge Pressure - Instability Alarm		10/16/2008 7:18:46 AM
AP001 - Discharge Pressure - Out of Range Alarm		10/16/2008 7:18:39 AM
AP001 - Seal Temperature - Out of Range Alarm		10/16/2008 7:18:51 AM

Event/Alarm History Time Range

Start Time: *-2h End Time: * Apply [Refresh] [Previous] [Next]

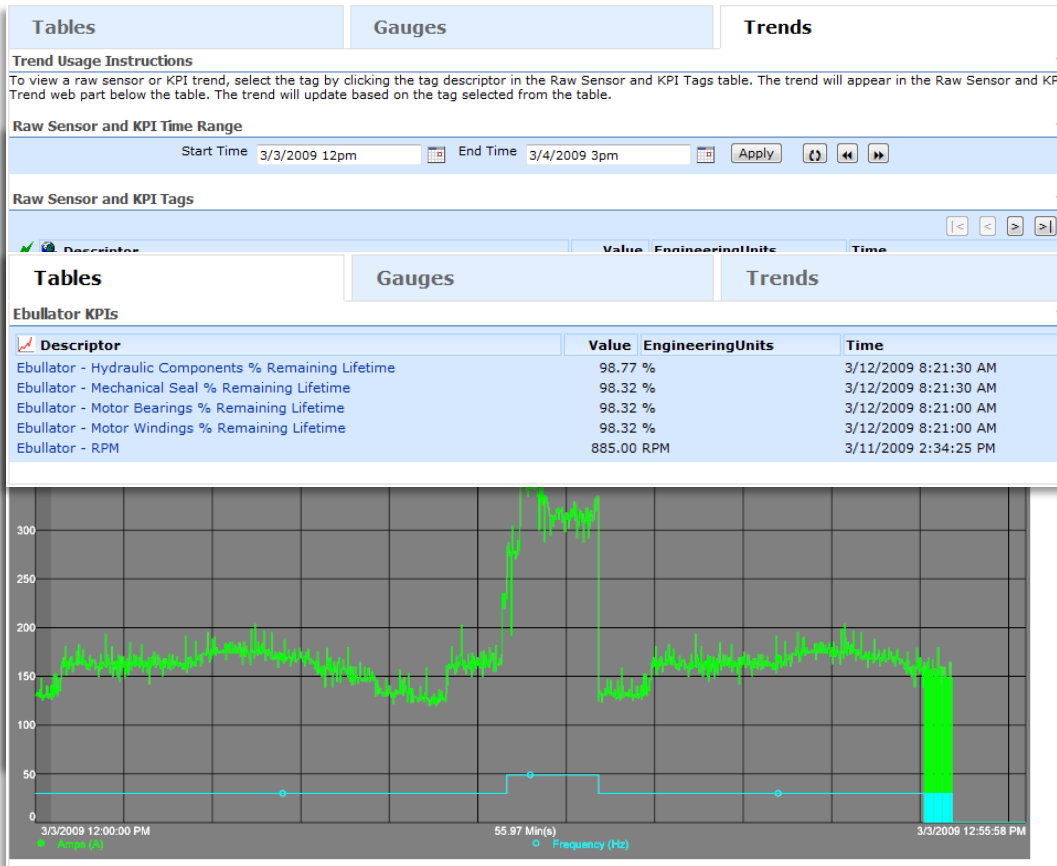
Event/Alarm History

Alert Type	State	Time Triggered	Value	Units
AP001 - Axial Vibration - Trend Change Alarm	HIGH	10/17/2008 2:00:30 PM	0.05	in/sec pk
AP001 - Axial Vibration - Trend Change Alarm	HIGH	10/17/2008 1:59:30 PM	0.04	in/sec pk
AP001 - Axial Vibration - Trend Change Alarm	HIGH	10/17/2008 1:58:00 PM	0.04	in/sec pk
AP001 - Radial Vibration - Trend Change Alarm	HIGH	10/17/2008 1:57:30 PM	0.10	in/sec pk
AP001 - Axial Vibration - Trend Change Alarm	HIGH	10/17/2008 1:56:31 PM	0.04	in/sec pk

Showing 1 to 5 of 52

- Setup based on sensory data, KPIs, or custom formulas
- Notifications are sent via e-mail or SMS
- Alarms are color coded

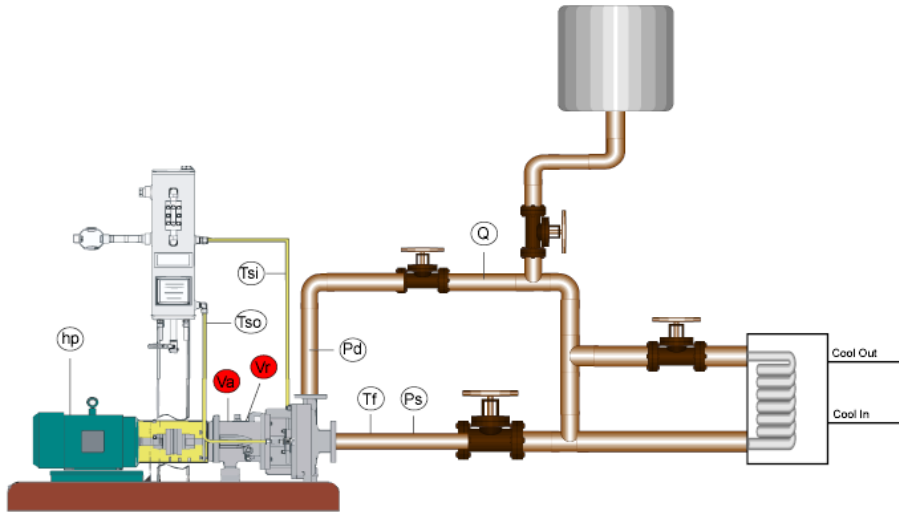
KPIs –Tables / Gauges / Trends



- Key Performance or Process Indicators
- Can be based on sensory data, equations, life cycle data, etc
- Multiple visualizations:
 - Tables, Gauges, Trends

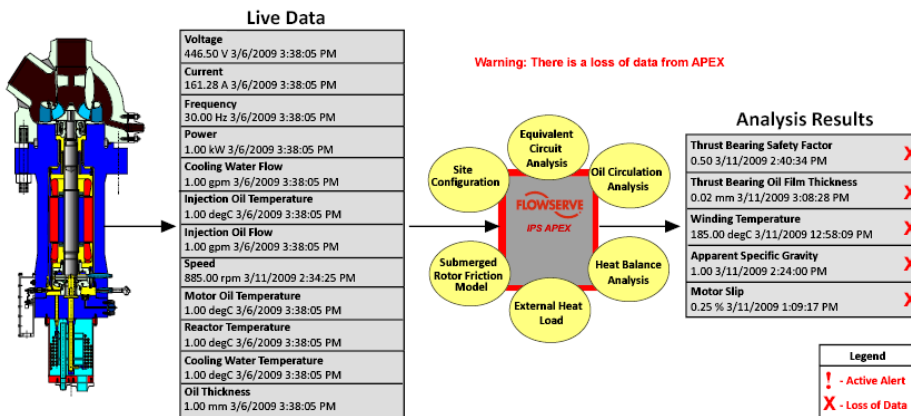
Schematics

Operational Overview



- Graphical representation of unit, equipment, or process
- Can contain:
 - Alarm indicators
 - Trends
 - Level indicators
 - Sensory values
 - Etc

Ebullator



Asset Info - Enterprise Data

- Maintenance Data
- Installation Information
- Drawings
- Bill of Materials

Flowserve > Customer 1 > Plant 1 > Standard Pump System

Welcome John Smith • | My Site | My Links •

Standard Pump System

Standard Pump System > Asset Information > Bill of Materials

Standard Pump Bill Of Materials

End user:	Dayton GTC	Type:	Mark III
City,State:	Dayton OH	Startup Date:	Oct 10 2007
Country:	USA	Pump Serial Number	NA

QUANTITY	PART NO.	DESCRIPTION	MATERIAL
1	D166070A-04	IMPELLER 3X2-62 RV	D4
1	AY1851A-304	NAMEPLATE PUMP F/ALL PROD LINE	304
0	PEZY	KIT PE GP2 MK3A	ALL
1	AY1851A-TECH	PEZ GP2 MK3A	TECH

Flowserve > Customer 1 > Plant 1 > Standard Pump System

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Standard Pump System

Standard Pump System > Asset Information > Drawings

Standard Pump Drawings

Customer: GTC
Site: Dayton, OH
Country: USA

Unit: Standard Pump System
Equipment: Mark III Pump
Serial Number: NA

8.2 Standard Mark 3 pump, Group 2 and Group 3

**Group 2 Optional duplex bearing arrangement
Group 3 Standard bearing clamp arrangement**

Part	Description	QTY	Part	Description	QTY
100	Bearing housing	1	400-2	Oring, bearing cover	1
101	Cover	1	400-1	Pha - bearing housing cover	1
102	Adapter - bearing housing	1	400-3	Pha - bearing housing shell	1
103	Adapter - bearing housing	1	400-4	Pha - bearing housing shell	1
104	Adapter - bearing housing	1	400-5	Pha - bearing housing shell	1
105	Adapter - bearing housing	1	400-6	Pha - bearing housing shell	1
106	Adapter - bearing housing	1	400-7	Pha - bearing housing shell	1
107	Adapter - bearing housing	1	400-8	Pha - bearing housing shell	1
108	Adapter - bearing housing	1	400-9	Pha - bearing housing shell	1
109	Adapter - bearing housing	1	400-10	Pha - bearing housing shell	1
110	Adapter - bearing housing	1	400-11	Pha - bearing housing shell	1
111	Adapter - bearing housing	1	400-12	Pha - bearing housing shell	1
112	Adapter - bearing housing	1	400-13	Pha - bearing housing shell	1
113	Adapter - bearing housing	1	400-14	Pha - bearing housing shell	1
114	Adapter - bearing housing	1	400-15	Pha - bearing housing shell	1
115	Adapter - bearing housing	1	400-16	Pha - bearing housing shell	1
116	Adapter - bearing housing	1	400-17	Pha - bearing housing shell	1
117	Adapter - bearing housing	1	400-18	Pha - bearing housing shell	1
118	Adapter - bearing housing	1	400-19	Pha - bearing housing shell	1
119	Adapter - bearing housing	1	400-20	Pha - bearing housing shell	1
120	Adapter - bearing housing	1	400-21	Pha - bearing housing shell	1
121	Adapter - bearing housing	1	400-22	Pha - bearing housing shell	1
122	Adapter - bearing housing	1	400-23	Pha - bearing housing shell	1
123	Adapter - bearing housing	1	400-24	Pha - bearing housing shell	1
124	Adapter - bearing housing	1	400-25	Pha - bearing housing shell	1
125	Adapter - bearing housing	1	400-26	Pha - bearing housing shell	1
126	Adapter - bearing housing	1	400-27	Pha - bearing housing shell	1
127	Adapter - bearing housing	1	400-28	Pha - bearing housing shell	1
128	Adapter - bearing housing	1	400-29	Pha - bearing housing shell	1
129	Adapter - bearing housing	1	400-30	Pha - bearing housing shell	1
130	Adapter - bearing housing	1	400-31	Pha - bearing housing shell	1
131	Adapter - bearing housing	1	400-32	Pha - bearing housing shell	1
132	Adapter - bearing housing	1	400-33	Pha - bearing housing shell	1
133	Adapter - bearing housing	1	400-34	Pha - bearing housing shell	1
134	Adapter - bearing housing	1	400-35	Pha - bearing housing shell	1
135	Adapter - bearing housing	1	400-36	Pha - bearing housing shell	1
136	Adapter - bearing housing	1	400-37	Pha - bearing housing shell	1
137	Adapter - bearing housing	1	400-38	Pha - bearing housing shell	1
138	Adapter - bearing housing	1	400-39	Pha - bearing housing shell	1
139	Adapter - bearing housing	1	400-40	Pha - bearing housing shell	1
140	Adapter - bearing housing	1	400-41	Pha - bearing housing shell	1
141	Adapter - bearing housing	1	400-42	Pha - bearing housing shell	1
142	Adapter - bearing housing	1	400-43	Pha - bearing housing shell	1
143	Adapter - bearing housing	1	400-44	Pha - bearing housing shell	1
144	Adapter - bearing housing	1	400-45	Pha - bearing housing shell	1
145	Adapter - bearing housing	1	400-46	Pha - bearing housing shell	1
146	Adapter - bearing housing	1	400-47	Pha - bearing housing shell	1
147	Adapter - bearing housing	1	400-48	Pha - bearing housing shell	1
148	Adapter - bearing housing	1	400-49	Pha - bearing housing shell	1
149	Adapter - bearing housing	1	400-50	Pha - bearing housing shell	1
150	Adapter - bearing housing	1	400-51	Pha - bearing housing shell	1
151	Adapter - bearing housing	1	400-52	Pha - bearing housing shell	1
152	Adapter - bearing housing	1	400-53	Pha - bearing housing shell	1
153	Adapter - bearing housing	1	400-54	Pha - bearing housing shell	1
154	Adapter - bearing housing	1	400-55	Pha - bearing housing shell	1
155	Adapter - bearing housing	1	400-56	Pha - bearing housing shell	1
156	Adapter - bearing housing	1	400-57	Pha - bearing housing shell	1
157	Adapter - bearing housing	1	400-58	Pha - bearing housing shell	1
158	Adapter - bearing housing	1	400-59	Pha - bearing housing shell	1
159	Adapter - bearing housing	1	400-60	Pha - bearing housing shell	1
160	Adapter - bearing housing	1	400-61	Pha - bearing housing shell	1
161	Adapter - bearing housing	1	400-62	Pha - bearing housing shell	1
162	Adapter - bearing housing	1	400-63	Pha - bearing housing shell	1
163	Adapter - bearing housing	1	400-64	Pha - bearing housing shell	1
164	Adapter - bearing housing	1	400-65	Pha - bearing housing shell	1
165	Adapter - bearing housing	1	400-66	Pha - bearing housing shell	1
166	Adapter - bearing housing	1	400-67	Pha - bearing housing shell	1
167	Adapter - bearing housing	1	400-68	Pha - bearing housing shell	1
168	Adapter - bearing housing	1	400-69	Pha - bearing housing shell	1
169	Adapter - bearing housing	1	400-70	Pha - bearing housing shell	1
170	Adapter - bearing housing	1	400-71	Pha - bearing housing shell	1
171	Adapter - bearing housing	1	400-72	Pha - bearing housing shell	1
172	Adapter - bearing housing	1	400-73	Pha - bearing housing shell	1
173	Adapter - bearing housing	1	400-74	Pha - bearing housing shell	1
174	Adapter - bearing housing	1	400-75	Pha - bearing housing shell	1
175	Adapter - bearing housing	1	400-76	Pha - bearing housing shell	1
176	Adapter - bearing housing	1	400-77	Pha - bearing housing shell	1
177	Adapter - bearing housing	1	400-78	Pha - bearing housing shell	1
178	Adapter - bearing housing	1	400-79	Pha - bearing housing shell	1
179	Adapter - bearing housing	1	400-80	Pha - bearing housing shell	1
180	Adapter - bearing housing	1	400-81	Pha - bearing housing shell	1
181	Adapter - bearing housing	1	400-82	Pha - bearing housing shell	1
182	Adapter - bearing housing	1	400-83	Pha - bearing housing shell	1
183	Adapter - bearing housing	1	400-84	Pha - bearing housing shell	1
184	Adapter - bearing housing	1	400-85	Pha - bearing housing shell	1
185	Adapter - bearing housing	1	400-86	Pha - bearing housing shell	1
186	Adapter - bearing housing	1	400-87	Pha - bearing housing shell	1
187	Adapter - bearing housing	1	400-88	Pha - bearing housing shell	1
188	Adapter - bearing housing	1	400-89	Pha - bearing housing shell	1
189	Adapter - bearing housing	1	400-90	Pha - bearing housing shell	1
190	Adapter - bearing housing	1	400-91	Pha - bearing housing shell	1
191	Adapter - bearing housing	1	400-92	Pha - bearing housing shell	1
192	Adapter - bearing housing	1	400-93	Pha - bearing housing shell	1
193	Adapter - bearing housing	1	400-94	Pha - bearing housing shell	1
194	Adapter - bearing housing	1	400-95	Pha - bearing housing shell	1
195	Adapter - bearing housing	1	400-96	Pha - bearing housing shell	1
196	Adapter - bearing housing	1	400-97	Pha - bearing housing shell	1
197	Adapter - bearing housing	1	400-98	Pha - bearing housing shell	1
198	Adapter - bearing housing	1	400-99	Pha - bearing housing shell	1
199	Adapter - bearing housing	1	400-100	Pha - bearing housing shell	1

Flowserve > Customer 1 > Plant 1 > Standard Pump System

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Standard Pump System

Standard Pump System > Asset Information > Maintenance

Standard Pump Maintenance

End user: GTC
City,State: Dayton, OH
Country: USA

Unit: Standard Pump System
Equipment: Mark III Pump
Serial Number: NA

Maintenance History

Date	Type	Comments
10/10/2007	Commissioning date	
11/9/2007	Failure	
8/8/2008	Test	
8/15/2008	Test	

Next Planned Pump Shutdown
1. Planned for Jan 2009

1) No Concerns reported

Ex: Bill of Materials

Flowserve > Customer 1 > Plant 1 > Standard Pump System

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This Site: Standard Pump Syst

Standard Pump System Reports Collaboration Asset Information Site Actions

Site Structure

- Flowserve
 - Customer 1
 - Plant 1
 - Standard Pump System
 - Standard Pump
 - Reactor
 - Ebullator
 - Customer 2
 - Plant 2
 - Customer 1
 - Plant 1
 - Standard Pump System
 - Standard Pump
 - Reactor
 - Ebullator

People Online

Name	Role	Location
Jack Green, Customer1	Lead Engineer	Houston
Charles Wolf, Customer1	Field Technician	Canada
Keith Watson	Senior Engineer	Houston
Bill Jones	Engineer	Canada
John Smith	Senior Engineer	Houston

[View All Site Content](#)

Documents

Lists

[Recycle Bin](#)

Part Availability

Part #: DY55718A-CI ([Lookup Part Availability](#))

Item #	Description	Whse Available	Restock	Qty On Hand	Sold Pumps	Sold Parts	Due In Shop	Due In PO
DY55718A-CI	HOUSING BRNG GP2 MK3A	MAIN	Yes	480	430	4	180	400

BOM Table:

Qty	Item #	Description	Unit
1	CY55742A-CI	CARRIER BRG GP2 MK3A	CI
1	DY55718A-CI	HOUSING BRNG GP2 MK3A	CI
1	95087151	O-RING -347 NBR	
2	95298428	PLUG SQ HD .25 ALLOY STEEL	
1	95094454	KEY .25 X .25 X 1.38	
1	95201018	LOCKWASHER BRG 10	
1	95200911	LOCKNUT	
1	Y21963A-SR	BEARING OB/IB GP2/2K/2V OIL	SR
1	AY58150A-SR	BEARING OB OIL GP2 MK3 STYLE	SR
4	95043741	SCREW HEX HD .50-13 X 1.75 CARB.STL	
1	95054318	SCREW HEX HD .75-10 X 1.25 CARB.STL	
3	95075461	SCREW SET SQ HD CUP PT .50-13X1.25	

Reports

The screenshot displays the FLOWERVE Standard Pump System web application. The interface includes a navigation menu on the left with options like 'People Online', 'Site Structure', and 'Performance Report'. The main content area shows the 'Alarm History Report - Time Range' and 'Performance Report' sections. The 'Performance Report' section includes a table with columns for Tag Name, Description, Average Value, Max Value, Min Value, and Range. Below this, there is a section for 'People Online' listing users and their roles. At the bottom, there is a section for 'Flowserve Documents Only' listing documents and their modification dates.

Performance Report Data:

Tag Name	Description	Average Value	Max Value	Min Value	Range
FLS.DAY.U01.AP001.LDI		14.82	35.40	0.00	
FLS.DAY.U01.AP001.Pd.DI		70.68	103.80	1.70	
FLS.DAY.U01.AP001.PS.DI		-3.85	3.20	-8.10	
FLS.DAY.U01.AP001.Q.DI		124.51	273.00	0.00	
FLS.DAY.U01.AP001.Tfluid.DI		108.61	131.50	68.90	
FLS.DAY.U01.AP001.Tfluid.DI.UC		108.61	131.50	68.90	
FLS.DAY.U01.AP001.TsealIn.DI		94.88	123.70	71.60	
FLS.DAY.U01.AP001.TsealOut.DI		113.34	139.10	71.70	
FLS.DAY.U01.AP001.Yaw.DI		0.03	0.07	-0.01	
FLS.DAY.U01.AP001.Yibhv.DI		0.06	0.13	0.00	

People Online:

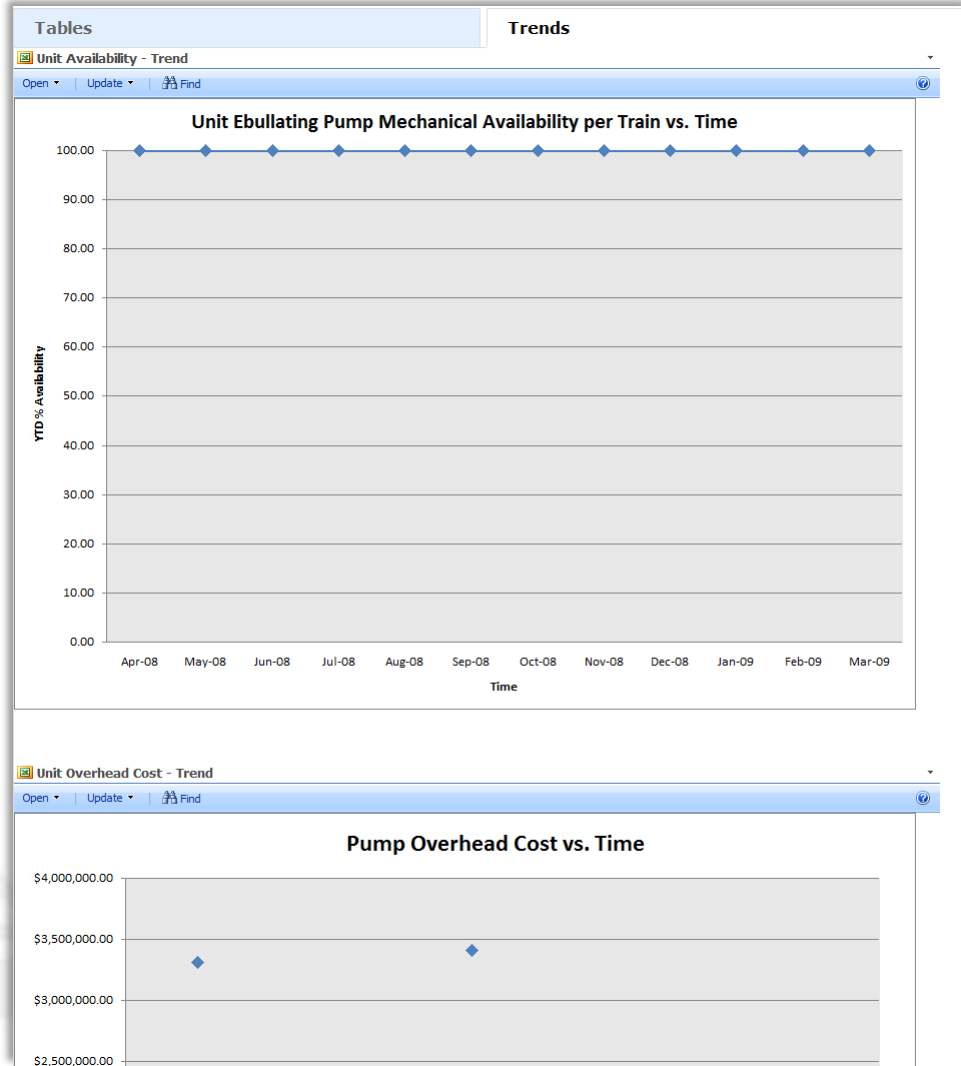
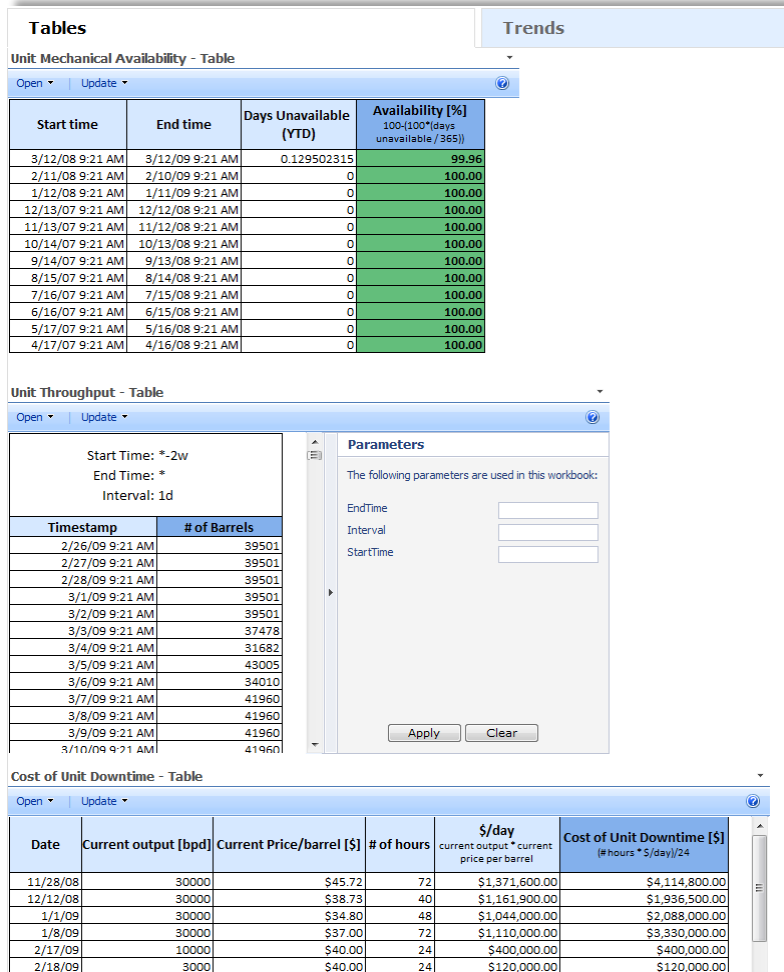
Name	Role	Location
Jack Green, Customer1	Lead Engineer	Houston
Charles Wolf, Customer1	Field Technician	Canada
Keith Watson, Senior Engineer	Senior Engineer	Houston
Bill Jones, Engineer	Engineer	Canada
John Smith, Senior Engineer	Senior Engineer	Houston

Flowserve Documents Only:

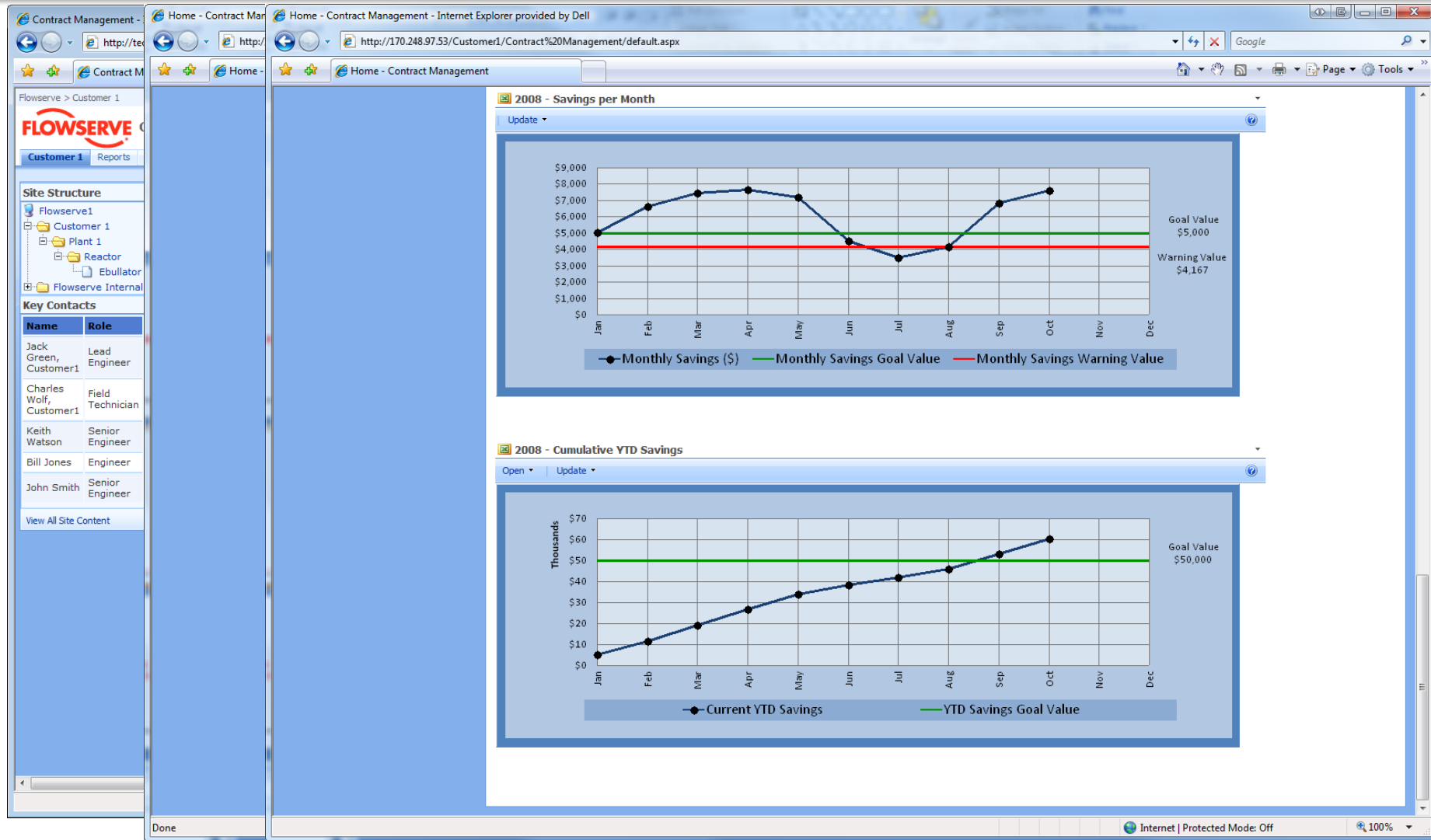
Type	Name	Modified	Modified By
	5 col Heat Exchanger Assembly Section	8/5/2008 11:02 PM	Keith Watson
	FD_TEAM_XPis and Alarms v1.2	7/26/2008 12:50 AM	Sidd Ruchandani

- Reports are built using Excel and shared via the web
- Custom layouts
- Can pull sensory data live and/or historically
- Can embed trends, graphics, etc.

Ex: Contract Reports



Contract Management



Plant / Customer Level



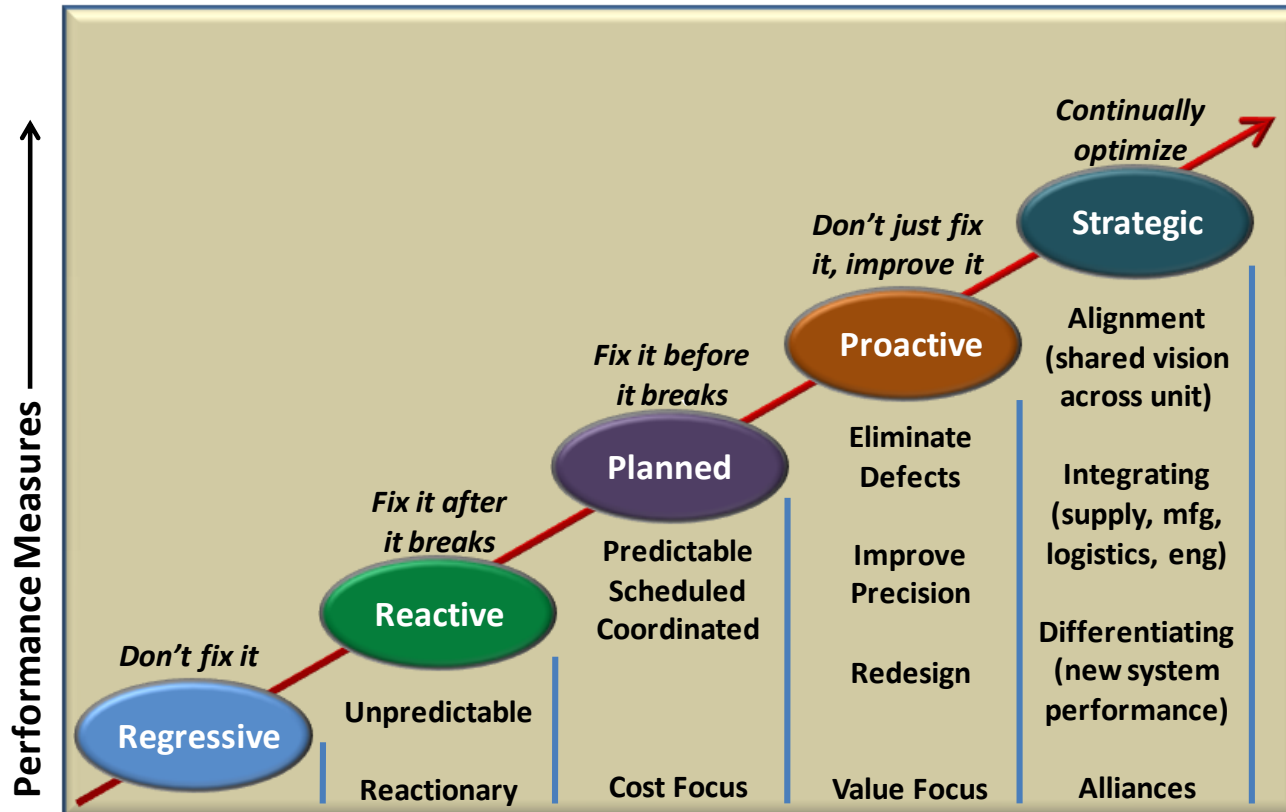
- Roll up data from lower levels
- Set different alarm points or contract additional data
- Announcements / collaboration

Tying it all together



Reducing Cost & Maximizing Reliability

Maintenance Models



- Training
- Failure prevention technology
- Predictive maintenance
- Energy monitoring & optimization
- Additional consultative services
 - Inventory reduction management assistance
 - Outsource repair/rebuild activities
 - Engineering services

Leveraging our industry leadership



Technology Advantage™
Information • Expertise • Performance



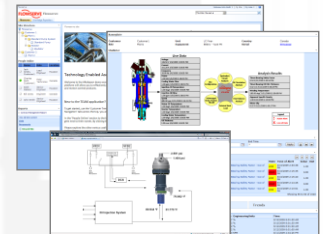
Global installed base, product portfolio and experience in fluid motion and control



A global network of service support, technical resources and Quick Response Centers



Our commitment to partner with our customers to lower their total Life Cycle Cost



Continued technology investments in intelligent devices, advanced communications & data convergence

The 'Service Model of the Future'.....Now



Integrated Solutions Group

Questions?